

**Note to readers with disabilities:** *EHP* strives to ensure that all journal content is accessible to all readers. However, some figures and Supplemental Material published in *EHP* articles may not conform to [508 standards](#) due to the complexity of the information being presented. If you need assistance accessing journal content, please contact [ehp508@niehs.nih.gov](mailto:ehp508@niehs.nih.gov). Our staff will work with you to assess and meet your accessibility needs within 3 working days.

### **Supplemental Material**

#### **PM<sub>2.5</sub> and Serum Metabolome and Insulin Resistance, Potential Mediation by the Gut Microbiome: A Population-Based Panel Study of Older Adults in China**

Liang Zhao, Jianlong Fang, Song Tang, Fuchang Deng, Xiaohui Liu, Yu Shen, Yuanyuan Liu, Fanling Kong, Yanjun Du, Liangliang Cui, Wanying Shi, Yan Wang, Jiaonan Wang, Yingjian Zhang, Xiaoyan Dong, Ying Gao, Li Dong, Huichan Zhou, Qinghua Sun, Haoran Dong, Xiumiao Peng, Yi Zhang, Meng Cao, Yanwen Wang, Hong Zhi, Hang Du, Jingyang Zhou, Tiantian Li, and Xiaoming Shi

#### **Table of Contents**

**Table S1.** Descriptive characteristics of 76 study participant in the following four visits and repeated measurement variables in the Jinan panel from 2018 to 2019.

**Table S2.** Significant metabolic pathways associated to PM<sub>2.5</sub> in the Jinan panel study.

**Table S3.** Percent change in insulin resistance-related biomarkers for a 10 µg/m<sup>3</sup> increase in PM<sub>2.5</sub> among older Chinese adults in the LME models with 95% confidence intervals.

**Table S4.** Percent change in insulin resistance-related biomarkers for a 10 µg/m<sup>3</sup> increase in PM<sub>2.5</sub> among older Chinese adults in the LME models with 95% confidence intervals (gender stratification).

**Table S5.** Kruskal-Wallis H test of featured genera amongst all study participants.

**Table S6.** Mediated effects of gut microbiota in the associations linking PM<sub>2.5</sub> with sphingolipid metabolism among older Chinese adults in the Jinan panel study.

**Table S7.** Sensitivity analysis models in the Jinan panel study.

**Table S8.** Sensitivity analysis results in the Jinan panel study.

**Figure S1.** The pathway of sphingolipid metabolism.

**Figure S2.** Percent change in insulin resistance-related biomarkers for a 10  $\mu\text{g}/\text{m}^3$  increase in  $\text{PM}_{2.5}$  among older Chinese adults in the LME models with 95% confidence intervals (gender stratification).

**Figure S3.** Changes in feces microbial diversities among older Chinese adults in the Jinan panel study.

**Figure S4.** Abundance of gut microbiota (16 genera) among older Chinese adults in the Jinan panel study.

**Figure S5.** Significant results of 16S rRNA associated with  $\text{PM}_{2.5}$  among older Chinese adults in the Jinan panel study.

**Additional File-** R code for mediation analysis.txt File and Excel Document